

COPE (E.D.)

AUTHOR'S EDITION.

DEPARTMENT OF THE INTERIOR.
UNITED STATES GEOLOGICAL AND GEOGRAPHICAL SURVEY.
F. V. HAYDEN, U. S. Geologist-in-Charge.

ON THE CANIDÆ
OF THE
LOUP FORK EPOCH.

BY
E. D. COPE, N. A. S.

EXTRACTED FROM THE BULLETIN OF THE SURVEY, Vol. VI, No. 2.

WASHINGTON, September 19, 1881.



Art. XVI.—On the Canidæ of the Loup Fork Epoch.

By E. D. Cope.

In the sixth volume of the Bulletin of the Survey, commencing at page 177, I gave an account of the *Canidæ* of the White River period, in its two subdivisions, the White River and Truckee epochs. Fourteen species were enumerated. At present I give a brief review of some of the species of the succeeding or Loup Fork formation, whose age I have placed as the highest Miocene. The number of species is not so large as that found in the preceding period, and those that are known approach more nearly in character the existing dogs. Some of them exceed in size any of those of the other period, and none are so small as the least of the White River forms.

Dr. Leidy has described the *Canes haydeni*, *saevus*, *temerarius* and *vafæ*, and I have added *Canes ursinus* and *wheelerianus*, and *Tomarctus brevirostris*.

Dr. Leidy also described an *Ælurodon ferox*, whose affinities he did not decide, but which he thought to combine characters of dogs and cats. I am able to prove by material now in my possession, that the *Ælurodon ferox* and the *Canis saevus* are the same species. The genus *Ælurodon* must be added to the *Canidæ*, and distinguished from *Canis* proper only by the presence of an anterior cutting lobe of the superior sectorial tooth, the character on which Dr. Leidy originally proposed it. There are three species of the genus known to me, the *Æ. saevus*, *Æ. wheelerianus* (*Canis* Cope), and a new one which I propose shall be called *Æ. hyænoides*. The character of the superior sectorial tooth above mentioned is as much like that of *Hyæna* as *Felis*, and the entire tooth in the *Æ. hyænoides* is much like that of the former genus. In all three species the premolars are very robust, as though to aid the sectorials in crushing bones, as they do in the hyænas. The second metacarpal bone has on its inner surface a rough area of insertion, such as is present in the dogs and absent in the hyænas, and which may indicate five digits in the anterior foot, the general character of the *Canidæ*.

ÆLURODON SÆEVUS Leidy.

Canis saevus Leidy, Proceed. Acad. Phila., 1858, p. 21.—*Ælurodon ferox* Leidy, I. c., 1858, p. 22; Extinct Mammalia Dakota and Nebraska, Plate I, Figs. 9 and 13, 14.

I have a large part of the skeleton, with entire skull, of an individual

of this species, and part of the skull and dentition of a second. The characters may be briefly given as follows:

Muzzle narrow and short, with small incisor and canine teeth; inner anterior basal lobe of superior sectorial very small. First tubercular very large, subtriangular. Mandibular ramus shallow; the external face not divided into two planes. Masseteric fossa less defined below.

ÆLURODON WHEELERIANUS Cope.

Canis wheelerianus Cope, Report Explor. Surveys W. of 100th Mer., Lieut. G. M. Wheeler, IV, pt. ii, p. 302, Pl. LXIX, Fig. 2.

This species was abundant in Nebraska, though originally discovered in New Mexico in the Loup Fork beds. It is a more robust animal than the *C. saevus*, and differs in various details. The skull was of about the same size, viz., rather shorter, but stouter than that of the *Canis lupus*. The characters are as follows:

Muzzle longer; canine teeth large; external superior incisor nearly as large at base of crown as canine. Anterior inner lobe of superior sectorial well marked. Mandibular ramus deeper and thicker, the external face in two planes, separated by a rounded angle.

One of the marked characters of this dog is the very large third superior incisor. In *Æ. saevus* it is much smaller than the canine as in most *Canidæ*.

ÆLURODON HYÆNOIDES sp. nov.

This dog is indicated by a fragment of the skull which includes the right premaxillary, maxillary, and most of the malar bones, coössified. The alveoli of all the teeth, except the I. 1, are present, and crowns of all the molars, excepting the Pm. I and M. II. The animal is adult, and rather aged.

The external incisive alveolus is large, but not equal to that of the canine. The latter is rather large, while that of the first premolar is small. The second and third premolars are robust, and somewhat swollen at the inner base. Each has a short heel but no median posterior lobe. The principal lobe is robust, in the third molar as wide as long at the base. The internal anterior lobe of the superior incisor is very large, and its apex is distinct from the inner side of the rest of the tooth. It is relatively larger than in the *Crocota brunnea*. The anterior lobe is well developed, but does not project so far as the other lobes. The first true molar is somewhat wider near the inner extremity of the crown than at the external extremity. The two external tubercles are not prominent nor well distinguished at the base from the ledge-like external cingulum. The alveolus of the second molar indicates a medium-sized tooth, and its anterior borders turned posteriorly so that the long axis is directed as much backwards as inwards. Enamel entirely smooth.

The muzzle was of medium length. The malar bone has a prominent acute postorbital process. The orbit was relatively as large as in the

wolf. The external infraorbital foramen is relatively and absolutely large, and issues above the anterior border of the superior sectorial tooth.

Measurements.

	M.
Length of entire superior dental series on middle line of palate.....	.067
Length of molar series.....	.045
Length of alveolus of canine.....	.010
Length of premolar series.....	.034
Length of sectorial or base of crown.....	.013
Width of sectorial in front.....	.010
Length of first true molar externally.....	.008
Width of first true molar externally.....	.013

From the preceding it is evident that the *Ælurodon hyænoides* differs from the two other species of the genus in its inferior size, the relatively smaller tubercular molars, which are wider interiorly, and the much larger internal anterior lobe of the superior sectorial.

The specimen on which it rests was found in Southern Nebraska by Mr. R. H. Hazard.

CANIS BRACHYPUS sp. nov.

This dog is represented by a considerable part of a skeleton, with skull, in a moderately good state of preservation. Both superior sectorial teeth are wanting, as well as most of the dorsal vertebræ and the humeri, femora, and tibiæ. Some metacarpals and metatarsals with an astragalus and some phalanges, give characters of the feet. The size of the species is about that of the *Canis latrans*.

As compared with the coyote, the prominent marks of distinction are the small sectorial teeth, the elevated sagittal crest, and the small feet. The sectorials have the character I have already ascribed to the sectorials of all the older carnivora, including the dogs of the Lower Miocene, and which has since been expressed by Huxley in the term "microdont." It prevails also among the dogs of the Loup Fork epoch, although the species of *Ælurodon* may be regarded as exceptions. The sagittal crest commences at a point above the anterior border of the glenoid surface, and extends posteriorly to above the foramen magnum. It is quite elevated and thin. The astragalus is well grooved, and, while as wide, is a little longer than that of the *Canis latrans*. The third metacarpal is one-fourth shorter than that of *C. latrans*, and the fifth metatarsal one-fifth shorter than the corresponding bone of *C. latrans*.

The length of the pelvis is equal to that of the ramus of the mandible, and is as large as the average of that of those of *C. latrans*. The cervical vertebræ are about the size of those of the same species, and are not so much depressed. The crest of the axis is considerably higher, and extends well fore and aft. The otic bullæ are not very large, but are much swollen. The paroccipital processes are well developed, and project backwards nearly as far as the posterior face of the occipital

condyles. They are connected with the otic bullæ by a plate of bone, which, with the process, is larger than that of the wolf. In this respect this species differs from all the Truckee and White River species, where the paroccipital process is either in contact with the bulla or little separated from it. The mandibular rami are moderately robust, and the masseteric fossa extends to the line of the posterior border of the first tubercular tooth. The coronoid process is large and obtuse above. The angle is prominent.

Measurements.

	M.
Length of skull (axial) .....	.196
Length of superior dental series .....	.093
Length of inferior dental series .....	.097
Length of inferior premolars .....	.049
Length of inferior sectorial base .....	.019
Elevation of inferior sectorial from base .....	.011
Length of mandibular ramus .....	.148
Elevation of ditto at coronoid .....	.060
Elevation of ditto at sectorial .....	.030
Length of axis with odontoid .....	.044
Length of remaining cervicals .....	.119
Length of lumbar vertebra .....	.028
Elevation of lumbar vertebra .....	.045
Diameters centrum do. { vertical .....	.013
{ transverse .....	.021
Depth of pelvis at obturator foramen, obliquely .....	.049
Diameter of acetabulum .....	.019
Length of third metacarpal .....	.048
Length of astragalus .....	.028
Length of fifth metatarsal .....	.062

The fine specimen which is above described was discovered by my assistant, J. C. Isaac, in a sandy bed of the Ticholeptus division of the Loup Fork formation. This, as I have elsewhere shown, is lower in position than the True Loup Fork. The locality is near Laramie Peak, Wyoming Territory.

